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RESEARCH

THERAPEUTIC POTENTIAL FOR TREATING PATIENTS WITH STRESS-RELATED CARDIOVASCULAR DISEASE

Recreational music-making alters gene expression pathways in patients with coronary heart disease.

Bittman, B., Croft, D. T., Brinker, J., van Laar, R., Vernalis, M. N., & Ellsworth, D. L. (2013).

Medical Science Monitor: International Medical Journal of Experimental and Clinical Research, 19, 139–147.

<http://doi.org/10.12659/MSM.883807>

Abstract

Background

Psychosocial stress profoundly impacts long-term cardiovascular health through adverse effects on sympathetic nervous system activity, endothelial dysfunction, and atherosclerotic development. Recreational Music Making (RMM) is a unique stress amelioration strategy encompassing group music-based activities that has great therapeutic potential for treating patients with stress-related cardiovascular disease.

Material/Methods

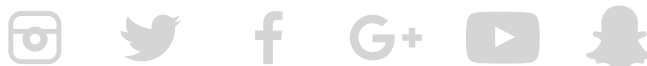
Participants (n=34) with a history of ischemic heart disease were subjected to an acute time-limited stressor, then randomized to RMM or quiet reading for one hour. Peripheral blood gene expression using GeneChip® Human Genome U133A 2.0 arrays was assessed at baseline, following stress, and after the relaxation session.

Results

Full gene set enrichment analysis identified 16 molecular pathways differentially regulated ($P < 0.005$) during stress that function in immune response, cell mobility, and transcription. During relaxation, two pathways showed a significant change in expression in the control group, while 12 pathways governing immune function and gene expression were modulated among RMM participants. Only 13% (2/16) of pathways showed differential expression during stress and relaxation.

Conclusions

Human stress and relaxation responses may be controlled by different molecular pathways. Relaxation through active engagement in Recreational Music Making may be more effective than quiet reading at altering gene expression and thus more clinically useful for stress amelioration.



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